

## Instructor's Guide to Teaching SolidWorks Software Lesson 10



School's Name  
Teacher's Name  
Date

### Loft Feature Overview

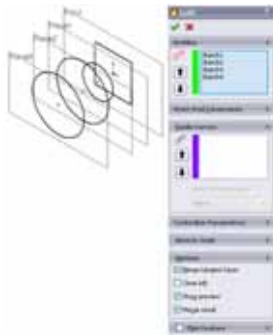
- Blends multiple profiles together.
- A Loft feature can be a base, boss, or cut.

To Create a Simple Loft Feature:

1. Create the planes required for the profile sketches.
2. Sketch a profile on the first plane.

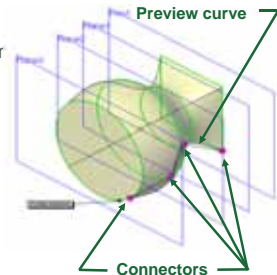
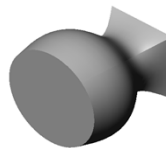
### Creating a Simple Loft Feature:

3. Sketch the remaining profiles on their corresponding planes.
4. Click **Features > Lofted Boss/Base**.



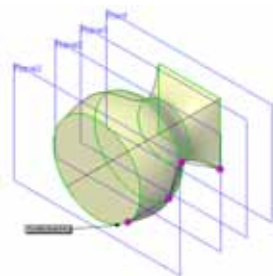
### Creating a Simple Loft Feature:

5. Select each profile.
6. Examine the preview curve at the connectors.
7. Click **OK**.



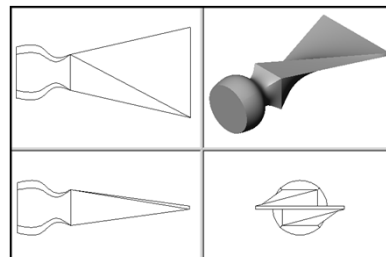
### Additional Information About Lofts:

- Neatness counts!
  - Select the profiles in order.
  - Click corresponding points on each profile.
  - The vertex closest to the selection point is used.
  - Drag the connectors to improve if necessary.
- A preview curve connecting the profiles is displayed.
- Review the curve in order to address adjustments.



### Neatness Counts!

- Unexpected results occur when you don't pick corresponding points on each profile.



## Neatness Counts!

- Rebuild errors can occur if you select the profiles in the wrong order.



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## To Create an Offset Plane:

- Hold down Ctrl and drag the Front plane in the direction you want the offset to go.

**NOTE:** Ctrl-drag is a common Windows technique for copying objects.

- The Plane PropertyManager appears.
- Enter 25mm for Distance.
- Click OK



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## Creating an Offset Plane – Results



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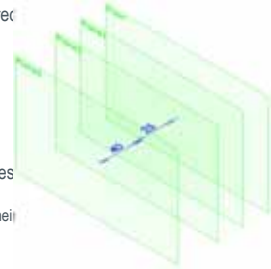
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## Setting up the Planes

Additional offset planes are required:

- Plane2* is offset 25mm from *Plane1*.
- Plane3* is offset 40mm from *Plane2*.
- Verify the positions of the planes
  - Click View, Planes.
  - Double-click the planes to see their offset dimensions.



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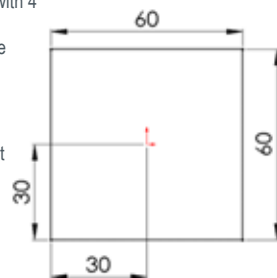
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## Sketch the Profiles

- The Loft feature is created with 4 profiles.
- Each profile is on a separate plane.

To Create the First Profile:

- Open a sketch on the Front plane.
- Sketch a square.
- Exit the sketch.



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## Best Practice

There is a better way to sketch a centered square:

- Sketch a Center Rectangle starting at the origin. This keeps the rectangle centered.
- Add an Equal relation to one horizontal and one vertical line. This makes the rectangle a square.
- Dimension one side of the square.



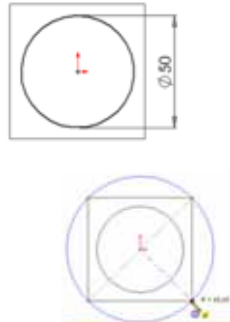
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## Sketch the Remaining Profiles:

1. Open a sketch on *Plane1*.
2. Sketch a circle and dimension it.
3. Exit the sketch.
4. Open sketch on *Plane2*.
5. Sketch a circle whose circumference is coincident with the corners of the square.
6. Exit the sketch.

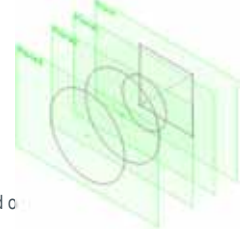


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## To Copy a Sketch:

1. Select *Sketch3* in the FeatureManager design tree or graphics area.
  2. Click Edit, Copy.
  3. Select *Plane3* in the FeatureManager design tree or graphics area.
  4. Click Edit, Paste.
- A new sketch, *Sketch4*, is created on *Plane3*.



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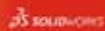


## More About Copying Sketches

- External relations are deleted.
- For example, when you copied *Sketch3*, the geometric relations locating the center and defining the circumference were deleted.
- Therefore, *Sketch4* is underdefined.
- To fully define *Sketch4*, add a Concentric relation between the copied circle and the original.
- If you sketch a profile on the wrong plane, move it to the correct plane using Edit Sketch Plane. Do not copy it.



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## To Move a Sketch to a Different Plane:

1. Right-click the sketch in the FeatureManager design tree.
2. Select Edit Sketch Plane from the shortcut menu.
3. Select a different plane.
4. Click OK .



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## Loft Feature

The Loft feature blends the 4 profiles to create the handle of the *chisel*.

1. Click Features > Lofted Boss / Base.

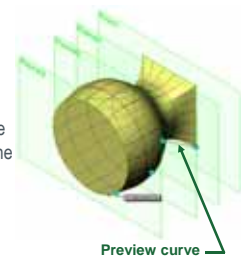


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## Creating the Loft Feature:

2. Select each profile.
  - Click on each sketch in the same relative location – the right side.
  3. Examine the preview curve.
- The preview curve shows how the profiles will be connected when the loft feature is created.




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### Creating the Loft Feature:

- The sketches are listed in the Profiles box.

The Up/Down arrows  are used to rearrange the order of the profiles.

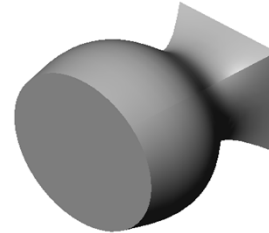


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### Creating the Loft Feature:

- Click OK .




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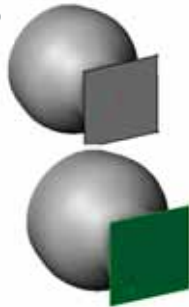


### A Second Loft Feature Creates the Bit of the Chisel:

The second Loft feature is composed of two profiles: Sketch5 and Sketch6.

To Create Sketch5:

- Select the square face.
- Open a sketch.
- Click Sketch > Convert Entities .
- Exit the sketch.

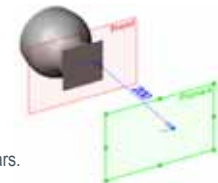


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### To Create Sketch6:

- Offset *Plane4* behind the *Front* plane.  
Hold down Ctrl and drag the *Front* plane in the direction you want the offset to go.
- The Plane PropertyManager appears.
- Enter 200mm for Distance.
- Click OK .

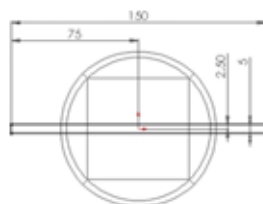


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### To Create Sketch6:


- Open a sketch on *Plane4*.
- Sketch a narrow rectangle.
- Dimension the rectangle.
- Exit the sketch.

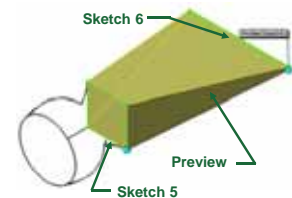


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### To Create the Second Loft Feature:

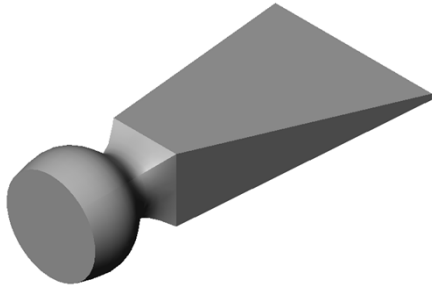
- Click Features > Lofted Boss / Base .
- Select *Sketch5* in the lower right corner of the square.
- Select *Sketch6* in the lower right corner of the rectangle.
- Examine the preview curve.
- Click OK.



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## Lofted Chisel



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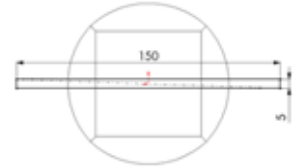
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## Tips and Tricks

Remember best practices:

- Only two dimensions are required for the narrow rectangle.
- Use a Center Rectangle to center the rectangle.
- This technique eliminates two dimensions *and* it captures the design intent.



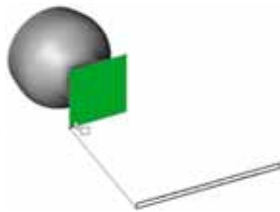
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## Tips and Tricks

- You do not need *Sketch5* (the sketch with the converted edges of the square face).
- Lofts can use the face as a profile. Select the face near the corner.
- OR, you can re-use *Sketch1* instead of creating *Sketch5*.



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